Developing a non-surgical contraceptive method for female dogs


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An ideal contraceptive agent for dogs will induce permanent sterility and be effective in male and female animals of all ages. Previous studies have shown that nicotine has the potential to serve as a contraceptive agent. We therefore tested the hypothesis that nicotine will maintain the anestrous state in female dogs.

Two groups of four female beagle dogs, 1 year of age were studied. Placebo and nicotine pellets that release a total of 0.5 mg of nicotine per kg body weight per day for 90 days were implanted subcutaneously in the base of the neck, close to the shoulder. The treatments were repeated after 90 and 180 days. Vaginal cytology was performed every week to detect ovarian follicular activity. Blood samples were collected every week for 270 days to measure serum progesterone and estradiol concentrations. After a total of 270 days all animals were euthanized, and blood and tissue samples were collected.

Serum estrogen and progesterone concentrations were significantly reduced in nicotine treated females from two weeks after implant insertion until project completion (one way ANOVA: p<0.05). No significant difference in body weight was observed between the control and treated females. Daily physical examinations, temperature, pulse and respiratory rates, fecal and urinary analyses, feed intake and regular serum chemistry analyses revealed no adverse effects of treatment on the health of the dogs. Ovarian and uterine weights were lower in nicotine treated females. Histologic evaluation of ovarian sections revealed typical anestrous features in the ovaries of treated females while control animals were found to have estrous or diestrous ovaries.

These preliminary observations suggest that nicotine treatment has the potential to maintain female dogs in anestrus, without inducing significant side-effects. Further studies will be required to confirm that there are no adverse effects associated with long-term nicotine treatment.

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